

NOTES ON AUSTRALIAN *TABANIDAE*. PART II.

By EUSTACE W. FERGUSON, M.B., Ch.M., and GERALD F. HILL, F.E.S.

(Ten Text-figures.)

[Read 26th July, 1922.]

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The arrival of Surcouf's Monograph of the *Tabanidae* (Wytsman's Gen. Insect., Fasc. 175, 1921) has revealed an extensive use of names, particularly in the genus *Tabanus*, preoccupied by species in other portions of the world. Unfortunately a name (*minusculus*) we proposed in our previous paper to replace a preoccupied name (*minor*) is also preoccupied, but as it is not given in Kertész's Catalogue, we overlooked its prior use.

The following names appear from Surcouf's work to be preoccupied. Alternative names are proposed for these in the body of the paper.

Tabanus confusus Taylor (1917) preoccupied by *T. confusus* Walker (1838); *T. latifrons* Ferg. (1921) by *T. latifrons* Zetterstedt (1842) = *T. cordiger* Meigen; *T. macquarti* Ric. (1915) by *T. macquarti* Schin. (1868) = *T. bigoti* Bellardi (1859); *T. meridionalis* Ferg. (1920) by *T. meridionalis* Thunb. (1827); *T. minusculus* Ferg. & Hill (1920) by *T. minusculus* Hine (1907); and *T. pygmaeus* Ferg. & Henry (1919) by *T. pygmaeus* Williston (1887).

There also seems to be a prior use of *Tabanus bifasciatus*, but the reference is queried as follows:—

144 ? *T. bifasciatus* Foureroy (= ? *Chrysops*) Ent. Paris, Vol. 2, p. 450 (1785) Europe.

This would appear to preclude the use of the name by Macquart (1834), but as the species has not been recognised in recent collections we do not propose to make any alteration in the name.

Silvius notatus Ric. (1915) might also be regarded as preoccupied by *Diachlorus notatus* Bigot (1893) a synonym of *Silvius quadricittatus* Say (*Chrysops*) (1823). In this case also we do not propose to alter Miss Ricardo's name, as *Diachlorus notatus* Bigot does not appear to have been known as *Silvius*

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notatus. If, according to the strict application of the rules of nomenclature, a change becomes necessary, *S. psarophanes* Taylor (1917) might be used for the species, or if, as suggested in our previous paper, *S. fuliginosus* Taylor (1916) is merely a geographical race of the same, then that name might be given precedence.

Pangonia dorsalis Macquart (1838) is apparently preoccupied by *Pangonia dorsalis* Latreille (1821), though Macquart's species has been placed by Surcouf in *Corizoneura*. Nothing resembling the description has been found by recent collectors in Australia, and we doubt if the species is really Australian, particularly as no Australian member of the Pangoninae known to us is without ocelli.

M. Surcouf similarly expresses doubt as to *Stibasoma hemiptera* Surcouf being Australian. A doubt is also expressed as to *Acanthocera australis* Ric. (1915) really belonging to this genus, in view of the fact that the antennae were missing when described.

Two species *Corizoneura alternans* Macq. and *C. sulcifrons* Macq., removed from the Australian list as African species, are still retained as from Oceania in M. Surcouf's monograph.

The locality of Australia, given by Surcouf (p. 134) for *Corizoneura umbratipennis* Ric., is an evident misprint for Africa.

Tabanus dubiosus Ric. (1915) from Australia is placed by Surcouf (p. 67) as a synonym of *T. dorsovittatus* Macq. (1855) from South America. That specific identity should exist between an Australian species and a South American is, we consider, extremely doubtful. Possibly the resemblance may be due to convergence. We do not know if *T. dorsovittatus* Macq. is a common and well authenticated South American species; if not, the question of correct location might require to be considered.

Two other species that occur on the Australian list should, we consider, be also removed as not being Australasian. Both are placed by Ricardo in *Pangonia* (sens. strict.) which, as far as our knowledge goes, does not occur in Australia.

Pangonia fulviventris Macq. (1838) was described from an unknown locality, but was queried by Walker as Australian. There appears to be no evidence whatsoever that it is from Australia.

Pangonia fuscipennis Macq. (1855), described from Cape of Needles, Oceania, is probably an African species. The evidence for this suggestion is that several other species described in the same place and from the same locality—*Cadicera rubramarginata* Macq., *Corizoneura alternans* Macq., *C. sulcifrons* Macq.—are now known to be African species. Cape of Needles is a translation of Cap des Aiguilles and in all probability is intended for Cape Agulhas, though, as Dr. Marshall who made this suggestion to us also points out, there is the possibility of Cape Aiguilles on Great Barrier Island, N. Zealand being the place intended. As *Pangonia* (sens. strict.) does not occur in New Zealand it is much more probable that the African locality is correct.

Under *Pangonius* Latr. in Surcouf's monograph, appear several Australian species relegated by Miss Ricardo to *Pangonia* (sens. lat.). Undoubtedly none of these will come into *Pangonius* (sens. strict.), but further consideration of the species concerned is deferred for the present.

A further alteration made by M. Surcouf that might be noted is the revival of the genus *Mesomyia* for species of *Silvius* with pubescent eyes. *S. niger* Ric. is placed in this genus, but *S. montanus* Ric., *S. imitator* Ferg. and *S. sulcifrons* Ferg. might also be placed here.

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M. Surcouf has also separated *Diclisa* from *Scione*, one Australian species (*Scione singularis* Macq.) being placed in *Diclisa*. Into the question of the validity of the two genera we do not propose to enter, but it must be emphasised that as *Scione* and *Diclisa* were founded on the same genotype—*S. incompleta*—the name *Diclisa* becomes an absolute synonym of *Scione* and cannot be separately used for a distinct genus.

It is rather unfortunate that several papers dealing with Australian Tabanidae have not been noticed by Surcouf. Many of these are probably of too recent date for inclusion, but species described in papers by Taylor and also by Hardy should not have been overlooked.

While our present communication deals in great measure with questions of synonymy and nomenclature, a number of new species are also described. These include one species of *Silvius* and 7 species of *Tabanus*.

APOCAMPTA SUBCANA Walker.

Chrysops subcanus, Walker, List Dipt. Brit. Mus., 1, 1848, p. 204.—*Apocampta subcana*, Ricardo, Ann. Mag. Nat. Hist., (7), viii., 1901, p. 287.—*Apocampta nigra*, Schiner, Nov. Reise, Dipt., 1868, p. 96; Ricardo, *op. cit.*, (7), v., 1900, p. 99.—*Diachlorus melas*, Bigot, Mem. Soc. zool. France, v., 1892, p. 625; Ricardo, *op. cit.*, (7), xiv., 1904, p. 357.—*Diatomineura ? gagantina*, Bigot, Mem. Soc. zool. France, v., 1892, p. 620; Ricardo, *op. cit.*, (8), xv., 1915.—*Diatomineura minima*, Ricardo, *op. cit.*, (7), v., 1900, p. 119, tab. 1, fig. 4-5.—? *Pangonia anthracina*, Macq., Dipt. Exot., Suppl. iv., 1850, p. 23, Tab. 2, fig. 3.—*Corizoneura anthracina*, Ricardo, *op. cit.*, (7), v., 1900, p. 113.

The synonymy *Chrysops subcana* Walk. = *Diachloris melas* Big. = *Apocampta nigra* Schin. has already been recorded by Ricardo, as has also that of *Diatomineura gagantina* Bigot with *Diatomineura minima* Ric.

At the request of one of us (E.W.F.) Dr. Guy Marshall very kindly compared a specimen sent to him with the types of *subcana*, *gagantina*, and *minima* and informed us that the three species were synonymous.

It is possible that *Corizoneura anthracina* Macq., should also be referred to the same species. The rather meagre description fits *subcana*, except that the eyes are described as bare; but as the specimen was abraded when described, this fact may account for the eyes being so described. There are specimens of *subcana* under the name of *anthracina* Macq. in the Macleay Museum.

On several occasions specimens have been received for identification (G.F.H.) which were taken whilst attacking persons bathing along the beaches of Magnetic Island, N.Q. (6.2.21).

DIATOMINEURA SUB-APPENDICULATA Macq.

Pangonia sub-appendiculata, Macquart, Dipt. Exot., Suppl. 4, 1850, p. 19.—*D. subappendiculata*, Ricardo, Ann. Mag. Nat. Hist., (7), v., 1900, p. 113.—*D. inflata*, Ricardo, Ann. Mag. Nat. Hist., (8), xvi., 1915, p. 34.

Macquart's species has not been identified by recent workers on Australian Diptera, but the size and description tally with *D. inflata* Ric.

The presence of an appendix to the fork of the third longitudinal vein is, however, variable, and in the majority of our series there is no appendix, but only a slight angulation; in some, however, there is a short but definite spur. The frontal callus is stated to be black, but it is more generally reddish; our series again shows this to be variable.

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It is probable that the actual type of *D. sub-appendiculata* has been examined by one of us (E.W.F.). In the Museum d'Histoire Naturelle, Paris, several specimens of *D. inflata* were seen, labelled *Pangonia fuscitarsis* Macq. This name, however, does not appear to have been published, and it seems possible that the name may have been altered before publication and *sub-appendiculata* inserted. The specimens were also labelled as from Tasmania and from the Verreaux collection. The species, however, has not been met with by recent collectors in Tasmania and is a common one in the coastal districts of New South Wales, so that the locality has probably been wrongly given.

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Pangonia violacea, Macquart, Dipt. Exot., Supp. 4, 1850, p. 22.

These flies were very plentiful indeed on Palm Island, N.Q. in late September. Specimens were taken on the beach, on hillsides, in scrub-covered ravines, on open grassy flats and in the dwellings. They were more sluggish than most species of the family, keep near the ground, and show a decided preference for persons dressed in dark-coloured materials.

Specimens of this species from the southern part of its range (New South Wales) are as a rule of a greenish-blue colour, while northern forms are more purple. Both forms are to be taken in southern Queensland. The Magnetic Island specimens are of interest in that their colouration corresponds with the southern form.

CORIZONEURA CHRYSOPHILA Walker.

Tabanus chrysophilus, Walker, List Dipt. Brit. Mus., 1, 1848, p. 155; Ricardo, Ann. Mag. Nat. Hist., (7), v., 1900, pp. 113, 120.—*Pangonia aurofasciata*, Jaenicke, Abh. Senck. Gesellsch., vi., 1868, p. 327, Pl. 43, fig. 5; Ricardo, *l.c.*, pp. 113, 120.—*Pangonia nigrosignata*, Thomson, Eugen. Resa., 1868, p. 541; Ricardo, *op. cit.*, (8), xvi., 1915, p. 36.—*Pangonia rufovittata*, Macq., Dipt. Exot., Supp. 4, 1850, p. 19.

The above synonymy, with the exception of *Pangonia rufovittata* Macq., is given on the authority of Miss Ricardo. This species was seen (E.W.F.) in the Paris Museum among Macquart's specimens of Tabanidae labelled *Pangonia rufovittata* Macq., n.sp. Tasmania No. 529. The description of *Pangonia rufovittata* also agrees with *C. chrysofila* Walk. The locality (Tasmania) given by Macquart is probably wrong, other records appearing to be all from Sydney—specimens are in the Australian and Macleay Museums from here. The species seems to be now much rarer, as few captures appear to have been made of recent years. There are, however, two specimens under examination, one taken at Roseville in January, 1914, and one at Broadwater, Richmond River, during last season (1920-21).

We have retained the old generic title for this and allied Australian species, though these species (at any rate *chrysofila* and *fulva*) do not come under the restricted generic diagnosis of *Corizoneura* given by Austen (Bull. Entomol. Research, xi., part 2, 1920, p. 139). At the same time, it hardly seems justifiable to place them under the new genus *Buplex*. Probably extensive alterations in the generic designations of Australian Pangoninae may be required owing to the revival of Walker's sub-genera (Insect. Saund., Dipt. Part I, 1850, pp. 7-11), and until all our Australian forms can be examined and compared with species from other parts of the world, it seems better to continue to employ, for the time being, the well-known nomenclature of Rondani.

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COENOPROSOPON HAMLYNI Taylor.

Taylor, Proc. Linn. Soc. N.S. Wales, xlii., 1917, p. 521, Plate xxviii., fig. 3.

Examination of the type in the Queensland Museum (E.W.F.) shows that the species is incorrectly referred to *Coenoprosopon*. The palpi are altogether different from the form described by Ricardo as characteristic of this genus, as will be seen from a glance at the figure given by Taylor. In *Coenoprosopon* the second joint is club-shaped with the expansion situated apically. The exact genus to which this species should be referred is uncertain, and provisionally it might be referred to *Corizoneura*, as the palpi are similar to those structures in *C. fulva* Macq. The antennae should have the third joint 8-annulate, but the annulations are not easy of definition, the apical 4 are distinct, but the basal 4 are more or less fused, with only indistinct traces of the annulations. A very similar structure is seen in *Pseudotabanus** and it is possible that *hamlyni* would be more correctly placed in that genus.

The name *Corizoneura* is used in the old sense; probably our Australian species will come under Austen's new genus *Buxlex*.

PALIMMECOMYIA WALKERI Newm.

Pangonia walkeri, Newman, Trans. Ent. Soc. Lond., iv., 1856, p. 56.—*Palimmecomyia celaenospila*, Taylor, Proc. Linn. Soc. N.S. Wales, xlii., 1917, p. 518, Plate xxviii., fig. 2.

There seems no doubt that Taylor's species is the same as Newman's. The latter's name has dropped out of Miss Ricardo's list, though given in Froggatt's. We are indebted to Mr. Longman, Director of the Queensland Museum, for the loan of a paratype of *Palimmecomyia celaenospila* Taylor, and it corresponds closely with Newman's description, the only difference being the omission of any mention of the lateral spots on the basal abdominal segments. The colouration is most distinctive, especially the contrast of the black scutellum and under surface with the yellow colour of the rest of the insect. Taylor's figure of the wing is darker than it should be, and Newman's terse description "alis, nitidissimis hyalinis, nebula apicali fusca" gives a better picture. The first posterior cell appears to be variable; it is described as open by Taylor, and is open in the paratype—the figure, however, shows it as nearly closed in the margin and in a specimen in the Macleay Museum it is closed above and united to the margin by a short stem.

Newman's type came from the same locality as Taylor's. The species extends into New South Wales, and the specimen in the Macleay Museum is from Lane Cove, Sydney, while there is also a specimen in the collection of the Department of Agriculture of New South Wales, from Temora.

SILVIUS EQUINUS, n.sp. (Text-figures 1 and 2.)

Colour. Antennae and thorax mummy brown, scutellum paler, 1st abdominal segment darker, palpi, proboscis and legs blackish-brown, wings uniformly dark smoky, excepting costal cell, which is darker than others; remainder of abdomen blackish, each segment excepting the last with a narrow but distinct apical fringe of white hairs. *Head* (Text-figs. 1 and 2): Frons clothed with golden pile and scattered short black hairs. Callus more or less quadrate, as wide as frons, with backward linear extension nearly reaching ocellar triangle. Occiput golden, with fringe of scattered silvery hairs. Antennae with first and second

* At any rate in *P. queenslandi* Ric., the only species of the genus examined.

COENOPROSOPON HAMLYNI Taylor.

Taylor, Proc. Linn. Soc. N.S. Wales, xlii., 1917, p. 521, Plate xxviii., fig. 3.

Examination of the type in the Queensland Museum (E.W.F.) shows that the species is incorrectly referred to *Coenoprosopon*. The palpi are altogether different from the form described by Ricardo as characteristic of this genus, as will be seen from a glance at the figure given by Taylor. In *Coenoprosopon* the second joint is club-shaped with the expansion situated apically. The exact genus to which this species should be referred is uncertain, and provisionally it might be referred to *Corizoneura*, as the palpi are similar to those structures in *C. fulva* Macq. The antennae should have the third joint 8-annulate, but the annulations are not easy of definition, the apical 4 are distinct, but the basal 4 are more or less fused, with only indistinct traces of the annulations. A very similar structure is seen in *Pseudotabanus** and it is possible that *hamlyni* would be more correctly placed in that genus.

The name *Corizoneura* is used in the old sense; probably our Australian species will come under Austen's new genus *Buxlex*.

PALIMMECOMYIA WALKERI Newm.

Pangonia walkeri, Newman, Trans. Ent. Soc. Lond., iv., 1856, p. 56.—*Palimmecomyia celaenospila*, Taylor, Proc. Linn. Soc. N.S. Wales, xlii., 1917, p. 518, Plate xxviii., fig. 2.

There seems no doubt that Taylor's species is the same as Newman's. The latter's name has dropped out of Miss Ricardo's list, though given in Froggatt's. We are indebted to Mr. Longman, Director of the Queensland Museum, for the loan of a paratype of *Palimmecomyia celaenospila* Taylor, and it corresponds closely with Newman's description, the only difference being the omission of any mention of the lateral spots on the basal abdominal segments. The colouration is most distinctive, especially the contrast of the black scutellum and under surface with the yellow colour of the rest of the insect. Taylor's figure of the wing is darker than it should be, and Newman's terse description "alis, nitidissimis hyalinis, nebula apicali fusca" gives a better picture. The first posterior cell appears to be variable; it is described as open by Taylor, and is open in the paratype—the figure, however, shows it as nearly closed in the margin and in a specimen in the Macleay Museum it is closed above and united to the margin by a short stem.

Newman's type came from the same locality as Taylor's. The species extends into New South Wales, and the specimen in the Macleay Museum is from Lane Cove, Sydney, while there is also a specimen in the collection of the Department of Agriculture of New South Wales, from Temora.

SILVIUS EQUINUS, n.sp. (Text-figures 1 and 2.)

Colour. Antennae and thorax mummy brown, scutellum paler, 1st abdominal segment darker, palpi, proboscis and legs blackish-brown, wings uniformly dark smoky, excepting costal cell, which is darker than others; remainder of abdomen blackish, each segment excepting the last with a narrow but distinct apical fringe of white hairs. *Head* (Text-figs. 1 and 2): Frons clothed with golden pile and scattered short black hairs. Callus more or less quadrate, as wide as frons, with backward linear extension nearly reaching ocellar triangle. Occiput golden, with fringe of scattered silvery hairs. Antennae with first and second

* At any rate in *P. queenslandi* Ric., the only species of the genus examined.

joints clothed with short black hairs; third joint globose in profile, compressed laterally. Palpi long and slender, clothed with numerous short black bristles. Genae with long black hairs. *Thorax*: Dorsum of thorax with traces of golden dusting, anterior two-thirds clothed with black hairs, posterior third and scutellum with white hairs. Legs densely clothed with black hairs, knees pale. *Wings*: Vein R. 4 without appendix but markedly geniculate. *Abdomen* long and narrow, densely clothed with black hairs, excepting apex of segments one to six which are white.

Dimensions: ♀. Total length, 11 mm.; wing, 10.5; width of head, 3.80; width of frons, 0.40.

Type unique; in coll. Australian Institute of Tropical Medicine, Townsville, N.Q.

Hab.—N. Queensland: Gordonvale, December (A. P. Dodd).

This species appears to be most closely related to *Silvius distinctus* Taylor (Bathurst Island, Northern Territory) from which it is distinguished, *inter alia*, by the form of callus, presence of silvery pubescence on thorax and scutellum, more sinuous vein R. 4, and much narrower white bands on abdomen.

A male from Moa Island probably belongs to the same species, but as both antennae are broken the identity is not certain.

SILVIUS TRYPPERUS Taylor.

Silvius trypperus, Taylor, Proc. Linn. Soc. N.S. Wales, xl, part 4, 1915, p. 811.—*Silvius elongatulus*, Taylor, *loc. cit.*, p. 812.—*Silvius elongatulus* var. *persimilis*, Taylor, *op. cit.*, xlv, part 1, 1919, p. 43.

We have had under examination a series of *S. elongatulus* Taylor, and of *S. elongatulus* var. *persimilis* Taylor from Batchelor and Stapleton and also the unique type of *S. trypperus* Taylor from Boorooloola. Included in the series are specimens from Stapleton which were placed by Taylor in two series A and B, no name being however attached. A. agrees with var. *persimilis* in that the base of the abdomen is lighter in colour, while B. agrees with *S. elongatulus*. In both cases there is, however, some difference in the shape of the callus. Examination of the series of *elongatulus* shows that the callus is variable in shape as is also the amount of light colouration of the base of the abdomen.

The type of *S. trypperus* Taylor has also been compared with the series and, while at first sight the species appears to differ from *S. elongatulus* in that the callus seems broader and less prominent, examples occur in the series of *S. elongatulus* in which the callus is exactly as in *S. trypperus*. One specimen has the callus of *S. trypperus* and the abdomen of *S. elongatulus* var. *persimilis*.

It seems evident therefore that these three names apply to only the one species which is, however, variable in the exact shape of the callus and in the abdominal colouration.

The name *trypperus* has priority of one page over *elongatulus*.

SILVIUS LURIDUS Walker.

Walker, List Dipt., 1, 1848, p. 140; Riardo, Ann. Mag. Nat. Hist., (7), v., 1900, p. 121 and (8), xvi., 1915, p. 260; Ferguson and Henry, Proc. Linn. Soc. N.S. Wales, xlv., 4, 1919, p. 838.—*S. hackeri*, Taylor, Proc. Linn. Soc. N.S. Wales, xlv., 1, 1919, p. 45.

The type of *S. hackeri* Taylor in the Queensland Museum has been examined and compared with a specimen of *S. luridus* Walk. from Kendall. The determination of the Kendall series was originally made by comparison of a specimen with Walker's type.

joints clothed with short black hairs; third joint globose in profile, compressed laterally. Palpi long and slender, clothed with numerous short black bristles. Genae with long black hairs. *Thorax*: Dorsum of thorax with traces of golden dusting, anterior two-thirds clothed with black hairs, posterior third and scutellum with white hairs. Legs densely clothed with black hairs, knees pale. *Wings*: Vein R. 4 without appendix but markedly geniculate. *Abdomen* long and narrow, densely clothed with black hairs, excepting apex of segments one to six which are white.

Dimensions: ♀. Total length, 11 mm.; wing, 10.5; width of head, 3.80; width of frons, 0.40.

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SILVIUS SORDIDUS Taylor.

S. sordidus, Proc. Linn. Soc. N.S. Wales, xl., 1915, p. 808—*S. subluridus*, Taylor, *op. cit.*, xli., 1916, p. 752.

We have examined the type of *S. subluridus* Taylor and cannot distinguish it from *S. sordidus* Taylor; the name must therefore be added to the synonymy already given by us in our previous paper (Proc. Linn. Soc. N.S. Wales, xlv., 1920, p. 462).

SILVIUS FULVOHIRTUS Taylor.

S. fulvohirtus, Taylor, Proc. Linn. Soc. N.S. Wales, xl., 1915 (1916), p. 814.—*S. vicinus*, Taylor, Proc. Linn. Soc. N.S. Wales, xlv., 1919, p. 46.

Two specimens of this rare species have recently been received for identification from Cairns district, N. Queensland.

A specimen which had been compared with the type *S. fulvohirtus* Taylor, was forwarded to the Queensland Museum and Mr. Hacker very kindly compared it with the type of *S. vicinus* Taylor in that Institution. Mr. Hacker subsequently wrote that, apart from some slight differences in the clothing and in the colour of the legs, the specimen sent agreed with the type of *S. vicinus*. He further stated that in his opinion the two species were identical, the apparent differences being due to abrasion and to fading.

TABANUS NEMOPUNCTATUS Ric.

T. nemopunctatus, Ricardo, Ann. Mag. Nat. Hist., (8), xiv., 1914, p. 388.—*T. aurihirtus*, Ricardo, *op. cit.*, (8), xv., 1915, p. 290.—*T. hackeri*, Taylor, Proc. Linn. Soc. N.S. Wales, xlii., 1917, p. 522.

The synonymy of this species is somewhat involved and has been the subject of much correspondence between the authors and Dr. Guy A. K. Marshall of the Imperial Bureau of Entomology, to whom their thanks are due for his kindness in helping to elucidate this and other problems.

The chief point at issue was the identity of the specimens in the British Museum labelled *T. townsvillei* Ric. These did not in the least correspond to the description given by Miss Ricardo, and we are now informed that the specimens in question are really the types and paratypes of *T. aurihirtus* Ric., the wrong name-label having been attached. The question of the identity of *T. townsvillei* Ric. must remain in abeyance for the present.

For our identification of *T. nemopunctatus* Ric., we are relying upon the comparison by Dr. Marshall of specimens sent to London (E.W.F.) under the name *T. hackeri*, these specimens having been kindly given us by the Queensland Museum authorities. In his letter Dr. Marshall states "*T. hackeri*, Taylor—very close to the unique type of *T. nemopunctatus* Ric., and doubtfully distinct." These specimens of *T. hackeri* have also been compared with what is practically a paratype of *T. nemopunctatus* in Mr. Froggatt's collection, and also with the original description and we cannot find any reason to separate them. The identity of *T. aurihirtus* Ric. with *T. nemopunctatus* Ric. is more open to question. The only difference apparently is that *T. nemopunctatus* has no callus, while one is described in *T. aurihirtus*. Miss Ricardo, however, notes that the callus may possibly be covered by the pubescence in very fresh specimens.

The series of *T. aurihirtus* before us was originally determined as *T. townsvillei* Ric. from comparison with the specimens in the British Museum referred to above. Comparison with our series of *T. hackeri* Taylor shows that the two series are certainly conspecific.

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Hab.—Our series includes specimens from the following localities:—Queensland: Palm Island, Townsville, Masthead Island, Bribie Island; New South Wales: Richmond River. The species thus appears to be purely a coastal form.

Note.—Further information on the identity of the two species has been received from Major E. E. Austen, who states definitely from a comparison of the types that *T. aurihirtus* Ric. is a synonym of *T. nemopunctatus* Ric.

TABANUS LATICALLOSUS Ric.

T. laticallosus, Ricardo, Ann. Mag. Nat. Hist., (8), xiv., 1914, p. 395.—*T. rufoabdominalis*, Taylor, Proc. Linn. Soc. N.S. Wales, xlii., 1917, p. 525.—? var. *T. heroni*, Ferguson, Rec. S. Aust. Mus., Vol. 1, No. 4, 1921, p. 372.

This species was described on three females from Moreton Island and a male from Stradbroke Island, Moreton Bay.

T. rufoabdominalis Taylor was described on both sexes from Stradbroke Island. We have under examination a series from Stradbroke Island (5 ♂, 1 ♀) which includes specimens received from the Queensland Museum as Taylor's species. The female specimen was sent to London and has been returned identified as *T. laticallosus* Ric. by Dr. G. A. K. Marshall.

We have also a specimen of *T. laticallosus* kindly sent out by Major E. E. Austen and bearing a label M.I., probably for Moreton Island, and evidently one of the specimens Miss Ricardo had under examination. This specimen measures 17 mm. as against 13-15 mm. for the series of *T. rufoabdominalis*, and agrees with a series from Byron Bay measuring from 17-19 mm. This latter series leads up to *T. heroni* (20 mm.) of which the type has been kindly loaned by the South Australian Museum authorities for the purpose of comparison. In *T. heroni* and in most of the Byron Bay series there is a continuous dark median abdominal stripe, and the clothing is generally white, though in some of the Byron Bay series it is golden as in *T. laticallosus*. Apart from size and the above-mentioned differences in clothing and colour, there seems no difference between *T. heroni* and *T. laticallosus*, while the Byron Bay series is intermediate. Further series will probably be necessary to settle the status of these various names, but from the available evidence it seems likely that *T. laticallosus* and *T. rufoabdominalis* are synonymous, while *T. heroni* is only a large variety of the same species.

Structurally, *T. laticallosus* is not closely allied to *parvicallus* Ric., but is much closer to *T. victoriensis* Ric.; the latter species is hardly separable from *T. heroni* except on colour, though both species occur together.

The specimens recorded by Taylor (Proc. Linn. Soc. N.S.W., xlii., 1917, p. 524) as *T. laticallosus* do not belong to this species, but apparently to an undescribed species near *T. aprepes* Taylor.

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Face, cheeks and subcallus similar to *T. neopalpalis*. Palpi shorter, the second joint stouter, though not greatly thickened at base, and slightly curved, ending in a blunt point, yellow, clothed on outer side with pale hairs with an occasional darker one. Antennae similar to *T. neopalpalis*, slightly lighter in colour. Forehead of same colour as face and clothed with similar tomentum,

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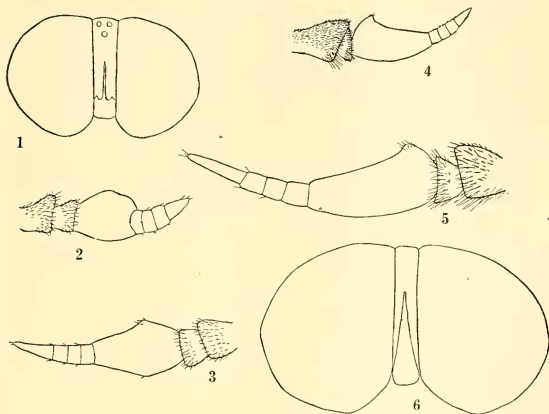
slightly but definitely narrower than in *T. neopalpalis*, very feebly narrowed to vertex, with sparse pubescence mostly pale; callus apparently absent in type, an inconspicuous hardly elevated laevigate area in this position in another specimen, possibly due to abrasion. Eyes bare.

Thorax as in *T. neopalpalis* with rather sparse golden decumbent pubescence.

Abdomen as in *T. neopalpalis*, apical segments somewhat darker; mainly with black pubescence with some golden pubescence in midline and at sides of segments.

Legs as in *T. neopalpalis*.

Wings with anterior border pale yellow, stigma inconspicuous, appendix present.



Text-figs. 1,2.—*Silvius equinus*, n.sp. 1. Head, frontal view; 2. Antenna.

Text-fig. 3.—*Tabanus pseudocallosus*, n.sp. Antenna.

Text-fig. 4.—*Tabanus breinli*, n.sp. Antenna.

Text-figs. 5,6.—*Tabanus palmensis*, n.sp. 5. Antenna; 6. Head, frontal view.

(All figures drawn from types).

Dimensions: Long, 8 mm.; wing, 9 mm.; width of head, 3.5 mm.; width of frons at widest part, 0.45 mm.

Hab.—N. Territory: Batchelor (Hill No. 1405). Type in Coll. Hill; paratypes in Coll. Aust. Institute of Tropical Medicine and Dept. of Public Health, Sydney. We have hesitated before describing this species as new on account of the great resemblance to *T. neopalpalis* from the same locality. The differences might conceivably be due to variation within the one species, but it seems unlikely that there should be variation in four different characters, such as there

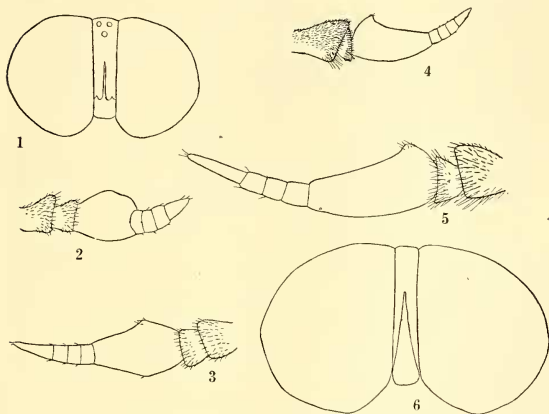
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are in the length of the palpi, in the frontal callus, in the width of the forehead, and in the costal cell of the wings.

It might be noted that the type of *T. neopalpalis* is much abraded, the abdomen and thorax being practically destitute of clothing. The present species is either one of a group of closely related species or else a form of a very variable species, which would include *T. neopalpalis*, *T. pseudopalpalis*, the following species and possibly even *T. nemotuberculatus*. Until long series are available it seems better to maintain these forms as distinct species and, in giving names to this and the following, we are doing so with the knowledge that in the future it is quite possible that our names will be relegated to synonymy.

TABANUS PSEUDOCALLOSUS, n.sp. (Text-fig. 3).

Closely allied to *T. nemotuberculatus* and to *T. neopalpalis*.

♀. Face and cheeks honey yellow, clothed with similar coloured tomentum and with a few scattered brown hairs; beard scanty, yellowish. Palpi coloured as face, second joint slender, ending in a long point, first joint with long grey and brown hairs beneath, second joint with mostly black hairs. Antennae (Text-fig. 3) reddish-yellow, first and second joints concolourous with face and clothed with black hairs; first segment greatly wider than second. Third segment moderate, broad at base, obtusely angulate without any tooth, annuli short. Forehead broader than in *T. nemotuberculatus*, slightly narrowed to vertex, rather darker than face, densely clothed with ochreous tomentum and with black hairs; callus small pyriform with short extension inconspicuous, of a chamois colour, not much contrasted with general colouration of forehead, resting on subcallus which is bare in middle and similarly coloured. Eyes bare.

Thorax dark brown, densely clothed with yellow tomentum with scattered golden decumbent pubescence and semi-erect black hairs. Sides with hair-tufts brown above, lighter creamy yellow below and posteriorly. Scutellum similar to dorsum.

Abdomen tawny, clothed with black pubescence with a few scattered golden hairs on mid-line and on segmentations. Venter similar but with fine creamy decumbent pubescence.

Legs yellowish, tarsi somewhat infusate, clothed with yellowish pubescence, black on tibiae. Wings brownish yellow along fore-border, otherwise hyaline. Stigma light brown elongate inconspicuous. Appendix present.

Dimensions: Long, 10.5 mm.; wing, 9 mm.; width of head, 4 mm.; width of frons at widest part, 0.60 mm.

Allied to *T. nemotuberculatus*, but differs in wider front with small though inconspicuous callus, more slender palpi, third antennal joint with less pronounced angulation and in the abdomen hairs being black, not yellow.

The present species also shows a decided approach to *T. neopalpalis*; the forehead is about of equal width and the palpi are similar, it differs however in the generally darker colour, in the different callus and in the dark anterior border of the wings.

Hab.—Northern Territory: Darwin. Type in Coll. Hill; paratypes in Collection of Department of Public Health, N.S. Wales.

TABANUS LEUCOPTERUS der Wulp.

Van der Wulp, Tijdsch. voor Entom., xi., 1868, p. 98.

This species is found on, or near, the sea coast, but on several occasions it has been taken attacking the occupants of boats several miles from the shore (Melville Island, Northern Territory, October 1916 and 1921).

are in the length of the palpi, in the frontal callus, in the width of the forehead, and in the costal cell of the wings.

It might be noted that the type of *T. neopalpalis* is much abraded, the abdomen and thorax being practically destitute of clothing. The present species is either one of a group of closely related species or else a form of a very variable species, which would include *T. neopalpalis*, *T. pseudopalpalis*, the following species and possibly even *T. nemotuberculatus*. Until long series are available it seems better to maintain these forms as distinct species and, in giving names to this and the following, we are doing so with the knowledge that in the future it is quite possible that our names will be relegated to synonymy.

TABANUS PSEUDOCALLOSUS, n.sp. (Text-fig. 3).

Closely allied to *T. nemotuberculatus* and to *T. neopalpalis*.

♀. Face and cheeks honey yellow, clothed with similar coloured tomentum and with a few scattered brown hairs; beard scanty, yellowish. Palpi coloured as face, second joint slender, ending in a long point, first joint with long grey and brown hairs beneath, second joint with mostly black hairs. Antennae (Text-fig. 3) reddish-yellow, first and second joints concolourous with face and clothed with black hairs; first segment greatly wider than second. Third segment moderate, broad at base, obtusely angulate without any tooth, annuli short. Forehead broader than in *T. nemotuberculatus*, slightly narrowed to vertex, rather darker than face, densely clothed with ochreous tomentum and with black hairs; callus small pyriform with short extension inconspicuous, of a chamois colour, not much contrasted with general colouration of forehead, resting on subcallus which is bare in middle and similarly coloured. Eyes bare.

Thorax dark brown, densely clothed with yellow tomentum with scattered golden decumbent pubescence and semi-erect black hairs. Sides with hair-tufts brown above, lighter creamy yellow below and posteriorly. Scutellum similar to dorsum.

Abdomen tawny, clothed with black pubescence with a few scattered golden hairs on mid-line and on segmentations. Venter similar but with fine creamy decumbent pubescence.

Legs yellowish, tarsi somewhat infusate, clothed with yellowish pubescence, black on tibiae. Wings brownish yellow along fore-border, otherwise hyaline. Stigma light brown elongate inconspicuous. Appendix present.

Dimensions: Long, 10.5 mm.; wing, 9 mm.; width of head, 4 mm.; width of frons at widest part, 0.60 mm.

Allied to *T. nemotuberculatus*, but differs in wider front with small though inconspicuous callus, more slender palpi, third antennal joint with less pronounced angulation and in the abdomen hairs being black, not yellow.

The present species also shows a decided approach to *T. neopalpalis*; the forehead is about of equal width and the palpi are similar, it differs however in the generally darker colour, in the different callus and in the dark anterior border of the wings.

Hab.—Northern Territory: Darwin. Type in Coll. Hill; paratypes in Collection of Department of Public Health, N.S. Wales.

TABANUS LEUCOPTERUS der Wulp.

Van der Wulp, Tijdsch. voor Entom., xi., 1868, p. 98.

This species is found on, or near, the sea coast, but on several occasions it has been taken attacking the occupants of boats several miles from the shore (Melville Island, Northern Territory, October 1916 and 1921).

Additional locality: Townsville, N.Q. (12.11.20 and 1.12.21) on child's head whilst bathing near sea beach.

TABANUS DAVIDSONI Taylor.

Taylor, Proc. Linn. Soc. N.S.W., xliv., 1919, p. 65.

Additional localities: Cairns District, N.Q. (Dr. J. F. Illingworth); Lake Macquarie, N.S.W. (Filmer).

TABANUS BREINLI, n.sp. (Text-fig. 4.)

Allied to *T. queenlandi* Ric. but with a narrower forehead.

Face and lower portion of cheeks covered with grey tomentum, and with long rather scanty whitish pubescence, subcallus and upper part of facial triangle with yellow-brown tomentum. Beard white. Palpi with second joint stout at base, ending in a moderately long acute point, yellowish clothed with moderately long appressed black pubescence; first joint with long white hairs below. Antennae (Text-fig. 4) reddish-yellow, with annuli darker, basal joints slightly paler; first joint almost as wide at apex as base of third joint, set with rather conspicuous black pubescence, thickest at upper apical angle; second joint much shorter than first joint, almost disc-shaped, partially overhung by the first joint; third joint moderately broad at base with conspicuous angle, annuli short. Forehead narrow, and narrower anteriorly than at vertex, clothed with yellow-brown tomentum, similar to clothing of subcallus, with short scanty dark pubescence; callus narrow, oblong, not reaching eyes, with a long linear extension to beyond middle. Eyes bare.

Thorax black, clothed with dark brown tomentum, more greyish towards sides and posteriorly with semi-erect black hairs and a few depressed pale ones, more evident behind wing-roots; shoulders reddish-brown with black hair-tufts; pleurae clothed with grey tomentum with long fine whitish hair-tufts, darker above. Sentellum similar to dorsum with a few pale hairs on free margin. Abdomen with first and second segments reddish-yellow, the remainder reddish-brown, becoming darker towards apex, with a pale median longitudinal vitta extending from base of second to sixth segments inclusive, somewhat lighter in colour than the first two segments and with traces of grey tomentum. Pubescence black on all the segments with vestiges of pale golden pubescence on the median vitta. Venter yellowish, somewhat darker towards apex, with pale pubescence and a few dark hairs in the middle of the segments. Legs yellowish, the anterior femora reddish-brown, the other femora darker at base, anterior tibiae dark in apical half, tarsi infusate, the base of first tarsal joint of middle and hind tarsi lighter.

Wings hyaline, the fore-border shaded with brown; this shading extends almost to tip of wing and is slightly intensified at end of second and upper branch of third longitudinal veins, the bifurcation of the third longitudinal also shaded; stigma yellowish-brown, not very conspicuous; no appendix present.

Dimensions: Type ♀, long, 12 mm., other specimens long, 13-14 mm.; wing, 11 mm.; width of head, 4.5 mm.; width of frons at widest part, 0.35 mm.

Hab.—North Queensland: Palm Island (Dr. Breinl, Hill No. 1401), Torres Strait, Moa Island (G. A. Lusecombe).

Described from 4 females.

The stripe on the abdomen seems to extend further towards the base in some specimens than in others; in the type the stripe cannot be traced further forwards than the base of the second segment, in the others this segment is darker

Additional locality: Townsville, N.Q. (12.11.20 and 1.12.21) on child's head whilst bathing near sea beach.

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Additional localities: Cairns District, N.Q. (Dr. J. F. Illingworth); Lake Macquarie, N.S.W. (Filmer).

TABANUS BREINLI, n.sp. (Text-fig. 4.)

Allied to *T. queenlandi* Ric. but with a narrower forehead.

Face and lower portion of cheeks covered with grey tomentum, and with long rather scanty whitish pubescence, subcallus and upper part of facial triangle with yellow-brown tomentum. Beard white. Palpi with second joint stout at base, ending in a moderately long acute point, yellowish clothed with moderately long appressed black pubescence; first joint with long white hairs below. Antennae (Text-fig. 4) reddish-yellow, with annuli darker, basal joints slightly paler; first joint almost as wide at apex as base of third joint, set with rather conspicuous black pubescence, thickest at upper apical angle; second joint much shorter than first joint, almost disc-shaped, partially overhung by the first joint; third joint moderately broad at base with conspicuous angle, annuli short. Forehead narrow, and narrower anteriorly than at vertex, clothed with yellow-brown tomentum, similar to clothing of subcallus, with short scanty dark pubescence; callus narrow, oblong, not reaching eyes, with a long linear extension to beyond middle. Eyes bare.

Thorax black, clothed with dark brown tomentum, more greyish towards sides and posteriorly with semi-erect black hairs and a few depressed pale ones, more evident behind wing-roots; shoulders reddish-brown with black hair-tufts; pleurae clothed with grey tomentum with long fine whitish hair-tufts, darker above. Scutellum similar to dorsum with a few pale hairs on free margin. Abdomen with first and second segments reddish-yellow, the remainder reddish-brown, becoming darker towards apex, with a pale median longitudinal vitta extending from base of second to sixth segments inclusive, somewhat lighter in colour than the first two segments and with traces of grey tomentum. Pubescence black on all the segments with vestiges of pale golden pubescence on the median vitta. Venter yellowish, somewhat darker towards apex, with pale pubescence and a few dark hairs in the middle of the segments. Legs yellowish, the anterior femora reddish-brown, the other femora darker at base, anterior tibiae dark in apical half, tarsi infusate, the base of first tarsal joint of middle and hind tarsi lighter.

Wings hyaline, the fore-border shaded with brown; this shading extends almost to tip of wing and is slightly intensified at end of second and upper branch of third longitudinal veins, the bifurcation of the third longitudinal also shaded; stigma yellowish-brown, not very conspicuous; no appendix present.

Dimensions: Type ♀, long, 12 mm., other specimens long, 13-14 mm.; wing, 11 mm.; width of head, 4.5 mm.; width of frons at widest part, 0.35 mm.

Hab.—North Queensland: Palm Island (Dr. Breinl, Hill No. 1401), Torres Strait, Moa Island (G. A. Lusecombe).

Described from 4 females.

The stripe on the abdomen seems to extend further towards the base in some specimens than in others; in the type the stripe cannot be traced further forwards than the base of the second segment, in the others this segment is darker

and the stripe extends the full length of the segment. The difference may be due to abrasion, as all the specimens (4) are abraded to some extent.

The species is allied to *T. queenslandi* Ric. and *T. strangmani* Ric. but differs from both, *inter alia*, in the much narrower forehead. The extent of the abdominal yitta varies in the three species.

Type in Australian Institute of Tropical Medicine, Townsville.

TABANUS STRANGMANI Ricardo.

Ricardo, Ann. Mag. Nat. Hist., (8), xiv., 1914, p. 393.

Additional Locality: Moa Island, Torres Strait (Rev. G. A. Luscombe, March).

TABANUS PALMENSIS, n.sp. (Text-figs. 5 and 6).

A medium-sized dark brown species with white spots on abdomen.

♀. Face and cheeks clothed with hoary grey tomentum, with a few scanty fine whitish hairs; beard white; subcallus not prominent, clothed with yellowish-brown tomentum in middle and grey at sides. Palpi dark brown, lighter on inner surface; second joint rather feebly thickened at base, ending in a long point, with rather dense dark pubescence. Antennae (Text-fig. 5) yellowish-brown, the first joint somewhat darker and the annuli infusate; first joint about twice as long as second, not concealing it, both set with black hairs. Third joint moderately broad at base with small obtuse tooth with a few black hairs. Forehead (Text-fig. 6) narrow, parallel-sided, densely clothed with brown tomentum and rather scanty dark pubescence; callus greatly elongate, broad at base, not quite reaching eyes, gradually narrowed to a long linear extension reaching to beyond middle. Eyes bare.

Thorax brown, with slight, very indefinite traces of darker markings, clothed with erect dark hairs and with scattered pale appressed pubescence, shoulders with long dark hairs; pleurae clothed with grey tomentum with tufts of long white hairs. Scutellum similar to dorsum, slightly darker in middle, with erect dark hairs and a somewhat scanty fringe of rather short pale pubescence. Abdomen deep brown, almost black, the segmentations very narrowly edged with grey, expanding in centre to form a series of triangular spots with apex pointed forwards on segments 1-5, with dark appressed pubescence on all the segments, the median row of spots clothed with whitish pubescence; lateral margins of segments grey, with grey pubescence. Venter clothed with dark brown tomentum, rather broadly banded on segmentations, with hoary grey expanding laterally, the pubescence dark in the basal portions, pale on the segmentations and lateral expansions. Legs reddish-brown, the anterior femora and tibiae darker except the basal third of tibiae, the other tibiae infusate at apices; tarsi dark. Wings dark grey, hyaline, slightly darker along the fore-border and very indistinctly shaded along the longitudinal veins; veins dark brown, stigma dark, conspicuous, no appendix.

Dimensions: Type ♀, 14 mm.; other specimens, 12-13 mm. Wing, 12 mm.; width of head, 4.5 mm.; width of frons, 0.40 mm.

Hab.—Palm Island, N. Queensland. (1.12.20, Hill No. 1361).

Described from 6 females.

This species does not agree with any known to us, nor with the descriptions of any of the outstanding species. It is perhaps most nearly allied to *T. doddi*, but it is smaller and of a somewhat narrower form, though small specimens of *T. doddi* are not unlike it in shape. The antennae and wings are, however, very different.

and the stripe extends the full length of the segment. The difference may be due to abrasion, as all the specimens (4) are abraded to some extent.

The species is allied to *T. queenslandi* Ric. and *T. strangmani* Ric. but differs from both, *inter alia*, in the much narrower forehead. The extent of the abdominal yitta varies in the three species.

Type in Australian Institute of Tropical Medicine, Townsville.

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Ricardo, Ann. Mag. Nat. Hist., (8), xiv., 1914, p. 393.

Additional Locality: Moa Island, Torres Strait (Rev. G. A. Luscombe, March).

TABANUS PALMENSIS, n.sp. (Text-figs. 5 and 6).

A medium-sized dark brown species with white spots on abdomen.

♀. Face and cheeks clothed with hoary grey tomentum, with a few scanty fine whitish hairs; beard white; subcallus not prominent, clothed with yellowish-brown tomentum in middle and grey at sides. Palpi dark brown, lighter on inner surface; second joint rather feebly thickened at base, ending in a long point, with rather dense dark pubescence. Antennae (Text-fig. 5) yellowish-brown, the first joint somewhat darker and the annuli infusate; first joint about twice as long as second, not concealing it, both set with black hairs. Third joint moderately broad at base with small obtuse tooth with a few black hairs. Forehead (Text-fig. 6) narrow, parallel-sided, densely clothed with brown tomentum and rather scanty dark pubescence; callus greatly elongate, broad at base, not quite reaching eyes, gradually narrowed to a long linear extension reaching to beyond middle. Eyes bare.

Thorax brown, with slight, very indefinite traces of darker markings, clothed with erect dark hairs and with scattered pale appressed pubescence, shoulders with long dark hairs; pleurae clothed with grey tomentum with tufts of long white hairs. Scutellum similar to dorsum, slightly darker in middle, with erect dark hairs and a somewhat scanty fringe of rather short pale pubescence. Abdomen deep brown, almost black, the segmentations very narrowly edged with grey, expanding in centre to form a series of triangular spots with apex pointed forwards on segments 1-5, with dark appressed pubescence on all the segments, the median row of spots clothed with whitish pubescence; lateral margins of segments grey, with grey pubescence. Venter clothed with dark brown tomentum, rather broadly banded on segmentations, with hoary grey expanding laterally, the pubescence dark in the basal portions, pale on the segmentations and lateral expansions. Legs reddish-brown, the anterior femora and tibiae darker except the basal third of tibiae, the other tibiae infusate at apices; tarsi dark. Wings dark grey, hyaline, slightly darker along the fore-border and very indistinctly shaded along the longitudinal veins; veins dark brown, stigma dark, conspicuous, no appendix.

Dimensions: Type ♀, 14 mm.; other specimens, 12-13 mm. Wing, 12 mm.; width of head, 4.5 mm.; width of frons, 0.40 mm.

Hab.—Palm Island, N. Queensland. (1.12.20, Hill No. 1361).

Described from 6 females.

This species does not agree with any known to us, nor with the descriptions of any of the outstanding species. It is perhaps most nearly allied to *T. doddi*, but it is smaller and of a somewhat narrower form, though small specimens of *T. doddi* does not unlike it in shape. The antennae and wings are, however, very different.

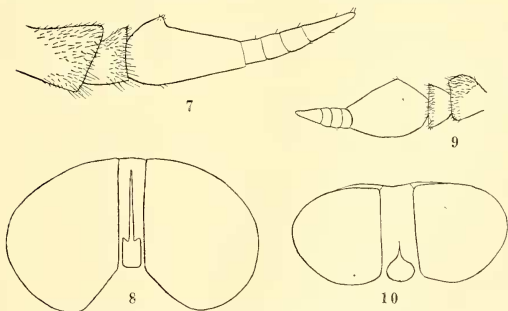
To the naked eye the wings appear practically uniformly dark grey, without any intensification along the veins, but very slight indications of this can be seen with a lens.

To some extent the present species shows a relation to *T. pseudoardens*, but the colouration and clothing are very different. The species would fall into Miss Ricardo's group viii. Type in Australian Institute of Tropical Medicine, Townsville.

TABANUS TORRESI, n.sp. (Text-figs. 7 and 8).

A moderate-sized brown species with narrow parallel-sided forehead.

♀. Face densely clothed with greyish white tomentum, with fine scanty white pubescence; subcallus reddish-brown, almost bare, with scanty brown tomentum at sides. Beard white. Palpi black, second joint moderately stout, rather slightly curved, and about three-quarters length of proboscis, clothed with black decumbent pubescence. Antennae (Text-fig. 7) yellowish-brown, the first joint reddish-brown and the annuli black; first joint not greatly widened at apex, set with black hairs on upper and lower margins, second short, third elongate, moderately dilatate at base, with a short tooth on upper surface, annuli about as long as rest of joint. Forehead (Text-fig. 8) comparatively narrow, parallel-sided; clothed with brown tomentum and a few dark hairs; callus reddish-brown to black, shiny, oblong, not quite reaching sides, with a long linear extension to vertex. Eyes bare.



Text-figs. 7,8.—*Tabanus torresi*, n.sp. 7. Antenna. 8. Head, frontal view.

Text-figs. 9,10.—*Tabanus griseicolor*, n.sp. 9. Antenna. 10. Head, frontal view.

(All figures drawn from types).



Thorax black, densely clothed with brown tomentum, with a lighter band on sides extending above wing-roots and on to scutellum; with sparse creamy depressed pubescence, denser on the lateral band and extending on to the sides and more thinly across base of scutellum, disc also with semi-erect dark hairs. Pleurae with grey tomentum and long tufts of silky white pubescence.

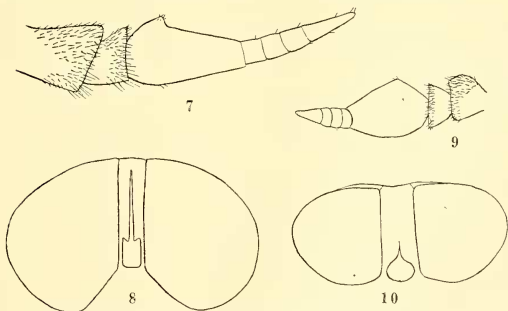
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Text-figs. 7, 8.—*Tabanus torresi*, n.sp. 7. Antenna. 8. Head, frontal view.

Text-figs. 9, 10.—*Tabanus griseicolor*, n.sp. 9. Antenna. 10. Head, frontal view.

(All figures drawn from types).

Thorax black, densely clothed with brown tomentum, with a lighter band on sides extending above wing-roots and on to scutellum; with sparse creamy depressed pubescence, denser on the lateral band and extending on to the sides and more thinly across base of scutellum, disc also with semi-erect dark hairs. Pleurae with grey tomentum and long tufts of silky white pubescence.



Abdomen with two basal segments reddish-brown, the remainder blackish, all the segmentations pale; clothed with black pubescence, with rather sparse creamy pubescence along segmentations extending slightly forwards in the median line on each segment. Venter light reddish-brown on basal segments, the remainder black, segmentations pale, pubescence black, pale on segmentations. Femora blackish, the apices of the intermediate and posterior somewhat lighter; tibiae yellowish-brown, infusate at apex, the anterior tibiae only pale in basal third; tarsi dark. Wings hyaline, with yellowish-brown along anterior margin and feeble shading along longitudinal veins; stigma rather large, elongate, black; veins light brown, no appendix present.

Dimensions: Type, 12.5 mm. long; wing, 11 mm.; width of head, 4.5 mm.; width of frons, 0.40 mm.

Hab.—Moa or Banks Island, Torres Strait.

Allied to *T. palmensis* Ferg. & Hill, but readily distinguished by the pale lateral margin of prothorax, forming a distinct band from in front of wing-roots round to scutellum. The shape of the callus is somewhat different, while the subcallus is more prominent and almost bare. The palpi are stouter and shorter. The abdomen is banded and very feebly maculate along middle. The clothing of the under surface is also different.

Of the species, we possess a single ♀ kindly sent by H. C. White and taken by one of his collectors on 30.11.19, and a short series sent by Rev. G. A. Luscombe, taken on 19.11.20 and February, 1921.

A specimen was sent to the British Museum for determination but was returned as not being in that collection. Type in collection of Australian Institute of Tropical Medicine, Townsville. Paratypes in Collection of Department of Public Health, Sydney.

TABANUS ALTERNATUS, NOV. NOM.

Tabanus limbatinevris, Macq., Dipt. Exot., Suppl. iv., 1850, p. 29 (nom. praeecc.).—*Tabanus macquarti*, Ricardo, Ann. Mag. Nat. Hist., (8), xv., 1915, p. 277, (nec *T. macquarti* Schiner, Reise der Novara, Dipt., 1868, p. 89 = *T. bigoti* Bellardi, 1859).

The range of this species is from about Camden Haven in New South Wales to Eidsvold in Queensland. Specimens have recently been taken on Magnetic Island, Townsville, which appear to represent a melanistic variety. The typical form is very variable in clothing and in the colouration of the abdomen, the pubescence varying from pure white to golden, and some of the darker white-haired specimens approach closely to the Magnetic Island form, but there appears to be a constant difference in the shape of the callus.

Var. MAGNETICUS, n.var.

Face, palpi and antennae as in *T. alternatus*, forehead with callus slightly wider, more rounded, not tapering above, but with a long linear extension to beyond middle. Thorax as in typical specimens, but with sparse white in place of golden decumbent pubescence; pleurae with hoary white hair-tufts.

Abdomen black, lateral portion of first segment greyish, the posterior margin of segments 2—4 narrowly margined with grey, broadened out at sides and with a series of median triangular spots on segments 1—4, not reaching to the anterior borders of the segments; pubescence black, white on the median spots and on the lateral portions of the segmentations of segments 1—4, continued

Abdomen with two basal segments reddish-brown, the remainder blackish, all the segmentations pale; clothed with black pubescence, with rather sparse creamy pubescence along segmentations extending slightly forwards in the median line on each segment. Venter light reddish-brown on basal segments, the remainder black, segmentations pale, pubescence black, pale on segmentations. Femora blackish, the apices of the intermediate and posterior somewhat lighter; tibiae yellowish-brown, infusate at apex, the anterior tibiae only pale in basal third; tarsi dark. Wings hyaline, with yellowish-brown along anterior margin and feeble shading along longitudinal veins; stigma rather large, elongate, black; veins light brown, no appendix present.

Dimensions: Type, 12.5 mm. long; wing, 11 mm.; width of head, 4.5 mm.; width of frons, 0.40 mm.

Hab.—Moa or Banks Island, Torres Strait.

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Var. MAGNETICUS, n.var.

Face, palpi and antennae as in *T. alternatus*, forehead with callus slightly wider, more rounded, not tapering above, but with a long linear extension to beyond middle. Thorax as in typical specimens, but with sparse white in place of golden decumbent pubescence; pleurae with hoary white hair-tufts.

Abdomen black, lateral portion of first segment greyish, the posterior margin of segments 2—4 narrowly margined with grey, broadened out at sides and with a series of median triangular spots on segments 1—4, not reaching to the anterior borders of the segments; pubescence black, white on the median spots and on the lateral portions of the segmentations of segments 1—4, continued

along the posterior margin of the fourth and sometimes of the third segment to connect up with the median spot, segments 5-7 entirely black.

Venter black, with the posterior margins of the second, third, and fourth segments distinctly banded with light grey.

Legs as in typical specimens.

Wings as in typical specimens, except that the black colouration is more intense.

Dimensions: Long, 15 mm.; wings, 14.5 mm.; width of head, 5.75 mm.; width of frons, 0.5 mm.

Hab.—North Queensland: Magnetic Island (Hill No. 1358).

A name has been attached to the variety as, though the typical species is variable in colouration, all the specimens from Magnetic Island are remarkably constant in this respect. The type specimen of the variety is in the collection of the Australian Institute of Tropical Medicine.

Messrs. Paskin Bros., to whom we are indebted for the specimens we have had for examination, informed us that these flies, and *T. avidus* Bigot, appeared in great numbers after heavy rain about the middle of September and for some weeks after their attacks upon man and horses seriously interfered with operations on the farm. Their numbers decreased gradually until the last week in November, when one of us visited the island to find only one fly during several days collecting. During the following year (1921) this species was very scarce indeed in the same locality.

TABANUS WENTWORTHI, n.sp.

A moderate-sized dark species allied to *T. alternatus* and *T. doddi*.

♀. Face dark, clothed with slaty-grey tomentum and with sparse dark pubescence; cheeks and subcallus with more yellowish-grey tomentum, the cheeks with somewhat denser dark pubescence. Beard white, rather scanty. Palpi yellow, somewhat infusate; second joint moderately long, comparatively slender, somewhat thicker at base and moderately curved, ending in a straight obtuse point; clothed with dark pubescence. Antennae black, with black hairs on first and second joints; first joint not concealing second, third joint with distinct tooth at base, and moderately long annulate portion. Forehead comparatively narrow, clothed with greyish-yellow tomentum and scanty dark pubescence; callus large, elongate pear-shaped, not reaching eyes, with a long extension almost to vertex. Eyes bare.

Thorax black with narrow pale submedian and lateral lines only distinct in anterior portion; pubescence dark, a few pale hairs present posteriorly; pleurae clothed with grey tomentum, and rather sparse dark pubescence, pale posteriorly. Scutellum black, with a rather sparse fringe of pale straw-coloured hairs. Abdomen black, portion of first and second segments feebly diluted with brown; clothed with black pubescence, with a median line of transverse spots clothed with whitish hairs on the posterior margins of the first to fifth segments, and a similar line on each side at lateral margins. Venter dark brown with lighter segmentations, clothed with black pubescence with traces of lighter on the segmentations. Legs dark; femora black, tibiae reddish-brown, the anterior dark on apical two-thirds; tarsi infusate. Wings dark grey, suffused with brown along the course of both longitudinal and transverse veins, the suffusion most marked in the region of the discal cell; stigma small, elongate, dark brown; no appendix present.

♂. Similar to ♀ in general appearance. Face and cheeks clothed with

along the posterior margin of the fourth and sometimes of the third segment to connect up with the median spot, segments 5-7 entirely black.

Venter black, with the posterior margins of the second, third, and fourth segments distinctly banded with light grey.

Legs as in typical specimens.

Wings as in typical specimens, except that the black colouration is more intense.

Dimensions: Long, 15 mm.; wings, 14.5 mm.; width of head, 5.75 mm.; width of frons, 0.5 mm.

Hab.—North Queensland: Magnetic Island (Hill No. 1358).

A name has been attached to the variety as, though the typical species is variable in colouration, all the specimens from Magnetic Island are remarkably constant in this respect. The type specimen of the variety is in the collection of the Australian Institute of Tropical Medicine.

Messrs. Paskin Bros., to whom we are indebted for the specimens we have had for examination, informed us that these flies, and *T. avidus* Bigot, appeared in great numbers after heavy rain about the middle of September and for some weeks after their attacks upon man and horses seriously interfered with operations on the farm. Their numbers decreased gradually until the last week in November, when one of us visited the island to find only one fly during several days collecting. During the following year (1921) this species was very scarce indeed in the same locality.

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♂. Similar to ♀ in general appearance. Face and cheeks clothed with

greyish-yellow tomentum, rather densely covered with dark hairs with some paler hairs intermingled; beard whitish. Palpi tawny, second joint rather short, oval-shaped, rather densely clothed with mingled dark and light pubescence. Antennae black as in ♀. Eyes large, holoptic, bare, with facets rather small, equal. Thorax as in ♀ but with more conspicuous pubescence, the pale straw-coloured hairs scantily present on anterior as well as posterior portion and more evident around scutellum. Abdomen with first three segments more evidently diluted with reddish-brown at the sides, pubescence more distinct.

Dimensions: ♀ holotype. Length, 14 mm.; wing, 13 mm.; width across eyes, 4.5 mm.; ♂ autotype, 15 mm.

Range of variation: ♀ 14-16 mm. (5 specimens); ♂ 13-15 mm. (2 specimens). Holotype ♀ and autotype ♂ presented to Australian Museum.

Hab.—New South Wales: Blue Mountains.

Specimens are under examination from the following localities: Leura, 2 ♀, January, 1920 (Dr. A. L. Maclean); Blackheath, 2 ♀, 12.2.22, 4.2.22 and 2 ♂, 22.2.22 (E. W. Ferguson); Blue Mts. (no locality) 1 ♀, January, 1922 (Deuquet). A specimen of this species is also in the South Australian Museum from Wentworth Falls. This specimen was commented upon by one of us (E. W.F., under *T. macquarti* Ric.) in a paper on the Tabanidae in that Institution (Records of South Australian Museum, Vol. 1, No. 4, 1921, p. 373).

In general appearance the species approaches closely to *T. alternatus* (= *T. macquarti* Ric.), but differs in the wing pattern which resembles that of *T. doddi* Taylor, though less marked. From the latter species it differs in the much shorter "tooth" on the base of the third antennal joint.

The species can hardly be *T. funebris* Macq., from the description of which it differs in size, palpi not black, and the absence of a recurrent appendix to the third longitudinal vein.

TABANUS PRAEPOSITUS Walker.

Tabanus praepositus, Walker, List Dipt. Brit. Mus., 1. 1848, p. 158; Ricardo, Ann. Mag. Nat. Hist., (8), xv., 1915, p. 273.—*Tabanus obscurimaculatus*, Taylor, Proc. Linn. Soc. N.S. Wales, xlv., part 1, 1919, p. 51.

A specimen of Walker's species was recently received by one of us (E.W.F.) from the British Museum, and proved to be the same as *T. obscurimaculatus* Taylor.

A specimen of Taylor's species was also sent to the British Museum (G.F.H.) and compared with the type of *T. praepositus* Walk.

TABANUS APREPES Taylor.

Taylor, Proc. Linn. Soc. N.S.W., xlv., 1919, p. 56.

Egg-masses were found at Magnetic Island, N.Q., (24th and 25th November) on twigs and grass overhanging small pools in the sandy bed of a creek, which had the appearance of those of the above species described in an earlier paper (Hill, Bull. Ent. Res., xii., 1921, p. 41). Three of these batches of eggs were subsequently reared to the final larval stages and proved to be referable to the above. The third batch produced larvae of a species not known to us in the immature stages. The history of the two batches of eggs of *T. aprepes* is as follows:—

(a). This mass was found at 5 p.m. on 24th November on a flower-head of *Juncus*, 5 inches above clean, wet sand at the margin of a small pool in creek-bed. When found the eggs were creamy white, but at 7 p.m. a few de-

greyish-yellow tomentum, rather densely covered with dark hairs with some paler hairs intermingled; beard whitish. Palpi tawny, second joint rather short, oval-shaped, rather densely clothed with mingled dark and light pubescence. Antennae black as in ♀. Eyes large, holoptic, bare, with facets rather small, equal. Thorax as in ♀ but with more conspicuous pubescence, the pale straw-coloured hairs scantily present on anterior as well as posterior portion and more evident around scutellum. Abdomen with first three segments more evidently diluted with reddish-brown at the sides, pubescence more distinct.

Dimensions: ♀ holotype. Length, 14 mm.; wing, 13 mm.; width across eyes, 4.5 mm.; ♂ autotype, 15 mm.

Range of variation: ♀ 14-16 mm. (5 specimens); ♂ 13-15 mm. (2 specimens). Holotype ♀ and autotype ♂ presented to Australian Museum.

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(a). This mass was found at 5 p.m. on 24th November on a flower-head of *Juncus*, 5 inches above clean, wet sand at the margin of a small pool in creek-bed. When found the eggs were creamy white, but at 7 p.m. a few de-

tached eggs and lower tiers of the main mass began to turn greyish, indicating that they were then about three hours old (see paper referred to above). The majority of the eggs hatched between 11 p.m. on 28th and 6 a.m. on 29th, the young larvae having already passed through their first moult in the interval.

(b). This mass was laid between 3.30 p.m. on 24th November and 9.30 a.m. on 25th November on a blade of grass 3 inches above the level of a small pool in the sandy creek-bed. As they were slightly greyish in colour when found, it is probable that they were laid late on the previous afternoon (the plant was examined at 3.30 p.m., when the eggs were certainly not present). Most of the eggs hatched between 11 p.m. on 28th November and 6 a.m. on 29th November, but a few did not free themselves from the mass until 10 p.m. on latter date.

The two batches were placed in large concrete troughs containing clean sand piled up at one end, and water at the other. Each trough was supplied with some water-lily leaves to which very small molluscs and other animals were adhering, and a large number of young mosquito larvae. The leaves were removed on the following day, and thereafter no food was given other than that provided by mosquito larvae (*Stegomyia fasciata*) which bred naturally in the trough. In order to make the mosquito larvae accessible to the young *Tabanus* larvae, the troughs were tilted up every few days so as to cause some of the former to become stranded on the sand. The water was changed weekly by pouring a fresh supply in at one end and siphoning it out at the other after filtration through the sand. On 31st January following, some of the larvae were 22 mm. in length and were evidently prospering, judging by the number seen during a cursory examination of the troughs. At this stage, through forgetting to keep ant-guards in efficient order, the entire contents of the three troughs were destroyed, but as specimens had been secured at intervals it was possible to establish the identity of two out of the three lots.

TABANUS OBSCURILINEATUS Taylor.

Taylor, Proc. Linn. Soc. N.S.W., xlv., 1919, p. 50.

Additional locality: Townsville District, N.Q.

TABANUS INNOTABILIS Walker.

Walker, List Dipt. Brit. Mus., i., 1848, p. 177.

Specimens have been received for identification from Moa Island (Torres Strait) and Port Moresby District (New Guinea).

TABANUS SEQUENS Walker.

Walker, List Dipt. Brit. Mus., i., 1848, p. 178.

These flies were plentiful on Magnetic Island and Palm Island, N.Q., during November and December, 1920. In the former locality they were very troublesome to horses which, it was noticed, were invariably bitten about the coronet and lower parts of legs.

TABANUS NEOGERMANICUS Ricardo.

Ricardo, Ann. Mag. Nat. Hist., (8), xv., 1915, p. 283.

This is a very common species on Palm Island, N.Q., and has been captured also on Magnetic Island and near Townsville, N.Q., November, 1920.

In life the eyes are emerald-green with copper-coloured iridescence.

tached eggs and lower tiers of the main mass began to turn greyish, indicating that they were then about three hours old (see paper referred to above). The majority of the eggs hatched between 11 p.m. on 28th and 6 a.m. on 29th, the young larvae having already passed through their first moult in the interval.

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In life the eyes are emerald-green with copper-coloured iridescence.

TABANUS GRISEICOLOR, n.sp. (Text-figs. 9 and 10.)

A moderately small grey species allied to *T. clavicallosus* Ric. but with wider forehead.

Face and cheeks densely clothed with greyish-yellow tomentum, with sparse whitish hairs; beard white, rather scanty. Palpi yellow, with moderately dense pale pubescence on outside, and with a few short dark hairs near apex; second joint moderately long, rather strongly curved, moderately thick at base. Antennae (Text-fig. 9) yellow, the third joint, except base, somewhat infusate, first joint longer but not greatly wider than second, third joint with basal portion expanded, obtusely angulate above but without tooth, annuli short. Forehead (Text-fig. 10) broad, about three times as long as broad, almost parallel-sided, very slightly narrower at vertex; densely clothed with somewhat more yellowish tomentum than face, with scanty pale pubescence and with erect dark hairs most marked at vertex; callus rather large, transversely oval, not reaching eyes, with a short linear extension. Eyes bare.

Thorax densely covered with light greyish-yellow tomentum with indistinct traces of darker brown longitudinal stripes, with scattered pale pubescence, and semi-erect dark hairs; pleurae similar, with tufts of long white pubescence. Scutellum similar to dorsum.

Abdomen thickly clothed with similar coloured tomentum to thorax; where denuded, the derm appears black, lighter on the segmentations; rather densely clothed with pale decumbent pubescence. Venter similar.

Legs with femora dark brown, tibiae yellowish-brown, the apical third of anterior tibiae infusate. Tarsi infusate.

Wings hyaline, costal cell and all the veins lightly suffused with brown; stigma elongate, rather dark; no appendix present.

Dimensions: Long, 9.5–10 mm.; wings, 9 mm.; width of head, 3.5 mm.; width of frons at widest part, 0.60 mm.

Hab.—Queensland: Hughenden. (March, 1921, Geo. Brady, Hill, No. 1445). The type and paratype respectively are in the Collection of the Aust. Institute of Tropical Medicine and Dept. of Public Health, N.S.W.

Described from two specimens. In one the abdomen appears darker and more conspicuously banded; this is apparently due to the clothing being more or less abraded on the basal portion of the segments. The general colour of the insect appears nearest to the dark olive of Ridgeway's standard colours.

The species is allied to *T. clavicallosus*, but differs in the somewhat wider forehead with differently shaped callus, and in its general lighter colouration.

TABANUS CLAVICALLOSUS Ric.

Ricardo, Ann. Mag. Nat. Hist., (8), xix., 1917, p. 219.—*T. griseus*, Taylor, Proc. Linn. Soc. N.S. Wales, xlv., 1919, p. 55.

A specimen was compared with the type of *T. griseus* in the Queensland Museum and afterwards compared with a paratype of *T. clavicallosus* Ric. No difference could be detected.

Specimens from Moa or Banks Island in Torres Strait appear to represent a geographical race if not a distinct species.

Var. BANKSIENSIS, n.var.

♀. Face, palpi, antennae, forehead, frontal callus and thorax as in *T. clavicallosus* Ric. Abdomen dark brown with lighter segmentations, the anterior

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Thorax densely covered with light greyish-yellow tomentum with indistinct traces of darker brown longitudinal stripes, with scattered pale pubescence, and semi-erect dark hairs; pleurae similar, with tufts of long white pubescence. Scutellum similar to dorsum.

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♀. Face, palpi, antennae, forehead, frontal callus and thorax as in *T. clavicallosus* Ric. Abdomen dark brown with lighter segmentations, the anterior

border of the second segment also lighter; clothed with black pubescence, with a few pale golden hairs along posterior margins, extending somewhat farther forwards in median line, but not producing definite spots. Venter dark brown with rather broad lighter segmentations, clothed with dark pubescence and with rather sparse pale pubescence mostly on the segmentations.

Legs as in *T. claviccallosus*.

Wings with anterior margins clouded with brown, this colour lightly suffusing the longitudinal veins and more markedly the cross veins at base of discal cell; stigma large and dark; appendix present. Long, 9 mm.; other females long, 8.5, 10.5, 11 mm.; wing, 9 mm.; width of head, 4 mm.; width of frons, 0.50 mm.

Four specimens under examination, two of which are larger than the others, and have a more reddish-brown abdomen. These specimens differ from typical specimens of *T. claviccallosus* Ric. in the evident banding of the abdominal segments and in the more intensely shaded anterior margin and veins of the wings. The differences hardly appear sufficient to justify specific separation, as in some specimens of *T. claviccallosus* the segmentations appear very slightly lighter than the rest of the derm, while the costal cell is slightly shaded.

T. darwinensis Taylor is also closely allied to *T. claviccallosus* Ric., and we were at first inclined to sink the name as a synonym. The abdomen is however unicolourous, the wings perfectly clear and the antennae are somewhat different in shape.

Compared with the form described above from Moa Island, *T. darwinensis* appears certainly distinct, but when compared with typical specimens of *T. claviccallosus* the distinctions are less obvious.

One might be inclined to regard the three forms as geographical races of *T. claviccallosus*, but for the fact that specimens of *darwinensis* have also been taken on Moa Island.

TABANUS PALMERSTONI, nov. nom.

Tabanus minusculus, Ferg. and Hill, Proc. Linn. Soc. N.S. Wales, xlv., 1920; p. 466 (nec *T. minusculus* Hine, 1907).—*Tabanus minor*, Taylor, Proc. Linn. Soc. N.S. Wales, xlv., 1919, p. 64 (nec *T. minor* Macq., 1850).

The substitute name *T. minusculus* was proposed by us to replace *T. minor* Taylor, a name previously used by Macquart. It is now necessary to replace our name for the species as it has already been used by Hine (Ohio Nat., (2), Vol. 8, 1907, p. 227) for a North American insect.

The new substitute name is taken from the old name (Palmerston) for Darwin, the type locality of the species.

TABANUS GERMANICUS Ricardo.

Ricardo, Ann. Mag. Nat. Hist., (8), xv., 1915, p. 282.

We have received examples of this species from Moa Island, Torres Strait (Rev. G. A. Luscombe, March) and from Mackay, Queensland (W. G. Harvey, 10.2.20).

TABANUS QUADRATUS Taylor.

Taylor, Proc. Linn. Soc. N.S.W., xlv., 1919, p. 52.

Numerous examples were captured (6.10.21) whilst attempting to bite persons travelling in a motor boat between Port Darwin and Melville Island (Northern Territory). The first flies were noticed when the boat was about



border of the second segment also lighter; clothed with black pubescence, with a few pale golden hairs along posterior margins, extending somewhat farther forwards in median line, but not producing definite spots. Venter dark brown with rather broad lighter segmentations, clothed with dark pubescence and with rather sparse pale pubescence mostly on the segmentations.

Legs as in *T. clavicallus*.

Wings with anterior margins clouded with brown, this colour lightly suffusing the longitudinal veins and more markedly the cross veins at base of discal cell; stigma large and dark; appendix present. Long, 9 mm.; other females long, 8.5, 10.5, 11 mm.; wing, 9 mm.; width of head, 4 mm.; width of frons, 0.50 mm.

Four specimens under examination, two of which are larger than the others, and have a more reddish-brown abdomen. These specimens differ from typical specimens of *T. clavicallus* Ric. in the evident banding of the abdominal segments and in the more intensely shaded anterior margin and veins of the wings. The differences hardly appear sufficient to justify specific separation, as in some specimens of *T. clavicallus* the segmentations appear very slightly lighter than the rest of the derm, while the costal cell is slightly shaded.

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TABANUS QUADRATUS Taylor.

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Numerous examples were captured (6.10.21) whilst attempting to bite persons travelling in a motor boat between Port Darwin and Melville Island (Northern Territory). The first flies were noticed when the boat was about



four miles off one of the Vernon Group of Islands and were afterwards captured at intervals until a landing was made on Melville Island. Several of the above species, as well as two examples of *Silvius indistinctus* Ricardo, were captured at a distance of not less than 10 miles from the nearest land (Melville Island), and upon going ashore at about 6 p.m., both species were found to be fairly plentiful, but far less so than *T. cinerascens* King and *T. neogermanicus* Ricardo.

TABANUS RIVULARIS, NOV. NOM.

Tabanus pygmaeus, Ferg. and Henry, Proc. Linn. Soc. N.S. Wales, xlv., 1919 (1920), p. 842, Pl. xlv., Fig. 2 (nec *T. pygmaeus* Williston, 1887).

A change of name is necessary, as *T. pygmaeus* has been already used by Williston for a North American species (Trans. Kansas Acad. Sc., Vol. 10, 1887, p. 141).

The present name is suggested by the habits of the adult insect. The original specimens came from Camden Haven; since then the species has been discovered at Eccleston on the Allyn River, a branch of the Patterson, on the north side of the Hunter River Valley. The species was found confined to the banks of the stream and attacking the heads of swimmers in the river (March, 1921).

TABANUS MORETONENSIS, NOV. NOM.

T. confusus, Taylor, Proc. Linn. Soc. N.S. Wales, xlii., 1917, p. 523 (*nom. praecoc.*).

The type of *T. confusus* Taylor in the Queensland Museum was examined (E.W.F.) recently, and found to be incorrectly placed in Miss Ricardo's Group iv. of the genus. The eyes are hairy, which places the species in Group xi. (*Theriopectes*), while the frontal callus is not absent, but is transverse, occupying the whole front and little prominent; owing to abrasion it would appear at first sight as if the callus were absent. The species belongs to the difficult *circumdatus-edentulus* group, but appears to be distinct.

A change of name is necessary as *T. confusus* has already been employed by Walker (List Dipt. Brit. Mus., i., 1848, p. 147) for a species from North America.

TABANUS CIRRUS Ricardo.

Ricardo, Ann. Mag. Nat. Hist., (8), xix., 1917, p. 222.—*T. robustus*, Taylor, Proc. Linn. Soc. N.S.W., xlv., 1919, p. 69.

A specimen from Palm Island, N.Q. (26.9.20) has been compared with Taylor's type by Mr. H. Haeker, and afterwards with Ricardo's type by Dr. G. A. K. Marshall.

TABANUS NEOLATIFRONS, NOV. NOM.

Tabanus latifrons, Ferg., Proc. Roy. Soc. Victoria, xxxiii., 1920 (1921), p. 19, Pl. ii., Fig. 1 (nec *T. latifrons* Zetterstedt, 1842).

The previous use of the name *T. latifrons* Zetterstedt (Dipt. Scand., Vol. i., 1842, p. 106) was quite overlooked in describing the Australian species. Zetterstedt's name is a synonym of *T. cordiger* Meigen (Syst. Besch., Vol. 2, 1820, p. 47) from the Mediterranean region.

TABANUS ADELAIDAE, NOV. NOM.

Tabanus meridionalis, Ferg., Records South Aust. Mus., Vol. 1, No. 4, 1921, p. 376 (nec *T. meridionalis* Thunberg, Nova Arta Upsal., Vol. 9, 1827, p. 58).

four miles off one of the Vernon Group of Islands and were afterwards captured at intervals until a landing was made on Melville Island. Several of the above species, as well as two examples of *Silvius indistinctus* Ricardo, were captured at a distance of not less than 10 miles from the nearest land (Melville Island), and upon going ashore at about 6 p.m., both species were found to be fairly plentiful, but far less so than *T. cinerascens* King and *T. neogermanicus* Ricardo.

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Tabanus meridionalis, Ferg., Records South Aust. Mus., Vol. 1, No. 4, 1921, p. 376 (nec *T. meridionalis* Thunberg, Nova Arta Upsal., Vol. 9, 1827, p. 58).

The previous use of the name *T. meridionalis* by Thunberg was also overlooked in describing the South Australian species. Thunberg's species is from an unknown locality.

TABANUS MILSONIENSIS, nov. nom.

Tabanus milsoni, Taylor, Proc. Linn. Soc. N.S. Wales, xli., 1916 (1917), p. 760 (nec *T. milsonis* Ric., Ann. Mag. Nat. Hist., (8), xix., 1917, p. 220).

Taylor's use of the name *T. milsoni* is antedated by Miss Ricardo's *T. milsonis* from the same locality by about two months.

We understood that Mr. Taylor was altering the name of this species, but as no substitute has so far been proposed we suggest the above name for the species.

TABANUS OCLATUS Ric.

Tabanus pusillus, Macquart, Dipt. Exot., Supp. v., 1854, p. 49 (*nom. praeocc.*).—*Tabanus oculatus*, Ricardo, Ann. Mag. Nat. Hist., (8), xvi., 1915, p. 276.—*Tabanus kendallensis*, Taylor, Proc. Linn. Soc. N.S. Wales, xlv., 1919, p. 68; Ferguson and Henry, Proc. Linn. Soc. N.S. Wales, xlv., 1919 (1920), p. 848.

We have examined a large number of specimens of *T. oculatus* from various parts of New South Wales, and cannot separate the Kendall species as distinct. The clothing of the thorax is very readily abraded and is really only seen in fresh specimens; the comparative width of the forehead also varies.

Hab.—N.S. Wales: Byron Bay, Richmond River, Dorrigo, Kendall, Comboyne, Wingham, Hawkesbury River, Sydney, Cronulla, Fenrith, Burragorang, Nattai River, Dubbo, Wolseley Park; Queensland: Brisbane (Oct., Dec., H. Hacker), Palm Island (1.12.20, Dr. Breinl).

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